Open Letter:

Rotational Phase Interferometry as a Laboratory Tool
for Testing Fundamental Physics
— Precedent from Alù et al. (Nature, 2026)

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Purpose of This Letter

Since early 2026, I have been developing and operating an 8-coil rotational phase interferometer as a laboratory tool to test predictions of the Unified Applicable Time (UAT) and Unified Causal Principle (UCP) framework [2, 3]. The experiment uses eight electromagnetic coils driven with a phase step of $\Delta\theta = 45^\circ \times k_{\text{early}} = 43.515^\circ$, where $k_{\text{early}} = 0.967$ is the quantum brake parameter derived from the UAT Lagrangian [4]. The measured residual amplitude $R_{\text{geom}} = 0.2792 \pm 0.0005$ matches the theoretical prediction from the 8-phasor interference formula [5].

Until recently, describing this methodology to colleagues unfamiliar with the UAT/UCP framework often met with understandable skepticism. Rotational phase interferometry with non-classical angular steps is not a standard technique in experimental physics.

The Precedent

On July 17, 2026, Nasari, Moussa, Alù, and collaborators published a landmark experimental result in Nature [1]: the observation of Floquet rotational superradiance using an electronically modulated ring of resonators that mimics the extreme rotation of a black hole. Their device does not rotate mechanically — it modulates its electromagnetic properties synchronously to create a synthetic rotating medium. Waves interacting with this medium extract energy and emerge amplified, confirming a prediction originally made by Zel'dovich and Penrose for rotating black holes.

The physical principle demonstrated by Alù et al. is the same principle underlying the 8-coil experiment: rotational phase modulation of electromagnetic fields can produce measurable, reproducible deviations from classical expectations.

Methodological Parallelism

Table 1 summarizes the conceptual and technical parallels between the two experiments.

Table 1: Comparison of the CUNY experiment (Nature, 2026) and the 8-coil UAT/UCP interferometer.

Principle	**Alù et al. (Nature, 2026)**	**8-Coil UAT/UCP Ex**
Synthetic rotation	Electronic modulation of resonator ring	8 phase fronts with ste
Physical mechanism	Floquet rotational superradiance	Rotational constructive i
Measured output	Wave amplification	Residual amplitude R_{geo}
Energy exchange	Wave extracts energy from rotating medium	Causal overflow $\varepsilon =$
Thermodynamic cost	Energy conservation requires dissipation	Quantum brake k_{early}
Validation status	Published in Nature, peer-reviewed	Laboratory measurement, not y

What This Letter Does NOT Claim

1. **The Nature paper does not validate the UAT/UCP framework.** Alù et al. did not set out to test any specific prediction of the UAT/UCP framework, and their result neither confirms nor refutes it.

2. **The 8-coil experiment has not been peer-reviewed.** It remains an independent laboratory measurement that requires replication by other groups before it can be considered established.

3. **The measured residual $R_{\text{geom}} = 0.2792$ is not claimed as evidence of new physics.** It is a laboratory result that is consistent with — but does not independently prove — the UAT/UCP prediction.

What This Letter DOES Establish

The experiment of Alù et al. demonstrates conclusively that **rotational phase modulation of electromagnetic fields is a legitimate and powerful experimental technique** capable of probing physical regimes previously thought accessible only through astrophysical observation. The fact that this technique was published in Nature —one of the world's most prestigious scientific journals— establishes its credibility within the mainstream physics community.

Consequently, the 8-coil rotational phase interferometer should be evaluated on its own merits as an experimental apparatus, not dismissed a priori due to its unconventional methodology. The underlying physical principle —that synthetic rotation of electromagnetic phases can produce measurable deviations from classical behavior— now has an independently published precedent.

Invitation

I invite any research group with the necessary equipment to replicate the 8-coil experiment. The full technical specifications, calibration protocol, and data analysis scripts are publicly

available on Zenodo [5]. Independent confirmation or refutation of the measured residual $R_{\text{geom}} = 0.2792$ would be a valuable contribution to determining whether the UAT/UCP framework describes physical reality or is merely an internally consistent mathematical structure.

Rotational phase interferometry is now an established technique.
The 8-coil experiment applies this technique to test the UAT/UCP framework.
Independent replication is welcome and encouraged.

References

[1] H. Nasari, H. Moussa, A. Alù et al., *Observation of Floquet rotational super-radiance*, Nature (July 2026).

[2] M. A. Percudani, *Universal Applied Time (UAT/UCP): A Fundamental Theory of Cosmology from First Principles*, Zenodo, 2024. DOI: `10.5281/zenodo.17729221`.

[3] M. A. Percudani, *The Causal Coherence Constant κ_{crit}: A Fundamental Limit on Retrocausal Influence*, Zenodo, 2024. DOI: `10.5281/zenodo.18210808`.

[4] M. A. Percudani, *The UAT Lagrangian: Derivation of the Quantum Braking Action*, Zenodo, 2025. DOI: `10.5281/zenodo.20500431`.

[5] M. A. Percudani, *Diferenciación de Métricas Fundamentales en el Modelo Percudani*, Zenodo, 2025.